ADVANCES IN COATING, LAMINATING & FINISHING EQUIPMENT

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By
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Robert J. Potterala

Masco System Corp.

Our First speaker this morning is Mr. Robert Potterala. Mr. Potterala is President of Masco System Corp. in Mauldin, SC. He has been with the firm since it inception in 1976. Prior to this position, he was product manager of Compton Knowles, Textile Finishing Machinery Division. Mr. Potterala has his Mechanical Engineering degree from Clemson University.

Masco was formed in 1976 to provide the textile industry with new concepts in textile finishing and treating applications. Masco has provided specialty designed tenter frames, tenter range equipment and specialized coating equipment both on frame and off frame units.

In 1980 Masco entered a joint venture with Hisaka Works LTD of Osaka, Japan to distribute their product line of jet dyeing equipment throughout the U.S. and Canada.

Today, Mr. Potterala will present "Coating Technology for the Next Five Years". Please welcome Robert Potterala.

Roger A. Lepourtre

Masurel Manufacturing Corp.

Our next speaker is Mr. Roger Lepourtre of Masurel Manufacturing Co. in Riverside. CT.

Roger received a M,B.A. degree from INSEAD, the European Institute of Business Administration, Fontainebleau, France. He then joined the International Division of J.P. Stevens, Inc. where he worked from 1961 to 1968. Since then he has been Chief Executive Officer of Sublistatic Corp. of America and Herbert Kannegiesser Corp.

Mr. Lepourtre established Masurel Manufacturing Co. in 1982. Masurels chief activities are the importation and sale of Meyer fusing, laminating and stamping equipment, XIRO adhesive film and other equipment and robotics.

Mr. Lepourtre will discuss, "Dry Adhesive Advances: The XIRO Film Approach." Please welcome Roger Lepourtre.

Manfred Helms

Ramisch Kleinewefers GmbH

Our final speaker this morning is Mr. Manfred Helmes of Ramish Kleinewefers of Krefeld, West Germany.

Mr. Helms has been the Regional Sales Manager for the areas of North America, the United Kingdom and Africa for approximately 6 years. He has a training in weaving and finishing and has represented various equipment producing companies world-wide

Ramisch Kleinewefers was formed as a company in 1974 with the merger of the two companies Ramisch and Klienewefers. The merged companies concentrate on building calenders for the textile and nonwovens industry and carding equipment for the nonwovens industry.

This morning, Mr. Helmes will present, "Lamination Technology of Substrates With Films by Means of Melt Roll Coating Process". Please welcome Manfred Helmes.

John A. Pasquale III

Liberty Machine Co., Inc.

Our first speaker this afternoon is Mr. John Pasqualle III, President of Liberty Machine Co., Inc. in Paterson, NJ.

Mr. Pasquale received a Mechanical Engineering degree and a Master of Science degree from Stevens Institute of Technology. He has authored numerous articles for Modern Plastics Encyclopedia and IFAI as well as being a speaker on numerous occasions.

Liberty Machine Co. is celebrating its 40th anniversary next month. This family owned business which Mr. Pasqualle spent time with since the age of ten, has concentrated on textile machinery manufacturing and repair and has since expanded into the paper and plastics industry.

Mr. Pasquale will present "Current and Innovative Technologies and Transfer Coating Applications". Please welcome John Pasquale.

Walter Skuballa

Kletec GmbH

Our next speaker is Mr. Walter Skuballa of Kletec, GmbH in Dinslaken, West Germany. He is a graduate of Berlin University with a Mechanical Engineers degree. He has worked for various international companies in the field of chemical processing and industrial equipment. He is currently President of Kletec.

Kletec GmbH is part of the SABA group of companies from the Netherlands. The SABA B.V. is a leading manufacturer of adhesives. Kletec designs and builds laminating machines and bonding equipment.

Mr Skuballa will present "Utilizing a One Component Adhesive with No Energy Output to Solve Common Laminating Problems.
Please welcome Mr. Walter Skuballa.

Roland Zimmer

Johannes Zimmer

Our next speaker is Mr. Roland Zimmer Of Johannes Zimmer in Spartanburg, SC. He received his degree in Mechanical Engineering.

He joined his fathers business in 1978 in their headquarters office in Klagenfurt, Austria. He received a broad background with the company before settling in the sales area. Since 1985 he has been based in the U.S. working their sales and service branch.

Mr. Zimmer will present "The Magnent System- Coating, Laminating and Finishing with and without Rotary Screens.

Cole Martin

Zima Corp.

Our final speaker today is Cole Martin. Mr. Martin is a sales engineer for Zima Corp.

Mr. Martin has been associated with the textile industry for 10 years. He has a Bachelor of Science degree from Auburn University with an emphasis on textile engineering. He has been involved in various capacities of weaving and yarn manufacturing machinery.

For the past 5 years Mr. Martin has been with Zima Corp. Zima Corp is the U.S. sales and service office for several european textile machinery manufacturers. Mr. Martin services the Stork X-Cel accounts with equipment for wallcovering, resilient floor coverings and coating machinery.

Mr. Martin will present "New Developments Utilizing Rotary Screen Techniques in Coating and Laminating Machines". Please welcome Cole Martin.

Presentation by: Robert J. Poterala, Mascoe Systems Corporation
May 15, 1986

C O A T I N G - T H E N E X T F I V E Y E A R S

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NGES ANTICIPATED

A. Domestic coating within the United States will face strong competition during the next five years. The larger plants and companies are changing their markets from apparel fabrics to industrial and commercial fabrics. This will provide increased competition to those already in this field.

B. Secondly, the industrial fabrics market will see increased penetration from overseas exporters who are looking for expansion.

The biggest question to those in the business will be "can we survive these changes?" With correct internal plant changes, the answer is "yes", even in the case of imported fabrics with very low cost labor input, the opportunity to survive in the U.S. market still remains. One must consider his advantages.

the exporter the following costs are allocated:

1. increased freight cost (10%)
2. import duties (7%)
3. brokerage fees (2%)
4. slower market turnaround (order to shipment)
5. increased sales agent fees (5%)
6. increased raw material costs (in the case manmade fiber)
7. increased utility cost (50% - 100%)

CLUSION: Although the exporter has the advantage of lower labor t, it is our conclusion that in the modern coating plant, the unit or per yard of fabric should be minimal and should in no way equal parallel the disadvantages of the exporter. The current problems face with imports is primarily due to the present inefficiency of S. operations which have been allowed to decline from lack of, or directed, investment dollars.

basic philosophy for survival is "getting the competitive edge". se manufacturers successful in obtaining this edge will survive, will in fact dominate the market. Those who do not will slowly, surely, die on the vine. The major key to success in the future l be automation; however, we must recognize that at this point in e - 1986 - all of the technology needed is not yet available.

Mascoe, a highly innovative manufacturer and importer of sophisticated dye equipment is totally committed to rapidly advancing automated features of its equipment. These features are and will be available to the U. S. market at the earliest possible date. In the meantime there are many items that both machinery manufacturers and textile manufacturers must combine to look at in order to resolve the needs of the future. The major problem will be that this automated equipment cost will be extremely high, there is no way it can be justified with the six month pay back theory; so therefore, the equipment must be designed multi-universal to cover future years of different products.

Returning to the topic "Coating - The Next Five Years" (getting the competitive edge), the following are goals that should be achieved:

1. Cost Efficiency - the producing of a product at the lowest possible cost. In terms of a coated fabric, the following formula should be applied:

   fabric + coating = delivery

   The basic concept of this formula means that everything not related to the above, including the worker who sweeps the floor, should be carefully analyzed with a view to elimination if not absolutely necessary to the production of the final product. Those items which cannot be eliminated must be assisted by automation.

2. Market versatility - being available to all possible markets. New products are conceived daily, their potential can only be determined from day to day supply. Efforts must be made to continuously produce new products and to find those products most suitable to your plant. To most effectively service this concept, equipment is needed which will allow the coating plant a turnaround no greater than two days on any new product. While this may seem impossible, with Mascoe System "4" coating equipment many new products have been developed within hours!

HOW DO WE GET THERE

Before advancing to a new endeavor, it is always helpful to analyze the past. This should entail a careful study of the past coating equipment. Most commonly used have been the submerged roll (kiss roll) coater, and the knife over roll coater. The attached sheets 1 & 2 should be helpful in analyzing the advantages and disadvantages.

The next step in evolving a decision for the future is to carefully analyze present equipment. Attached sheets 3, 4, and 5 will be helpful.

It should be carefully noted that Mascoe has made a determined effort to reduce both the use and waste of chemical compounds in the design of its new System "4" coating equipment. This equipment has been

letely redesigned and field proven over the last two years. It rs many advantages toward helping the coating plant meet cost ction objectives for the next five years.

equipment is readily available and offers multiple coating ngements which are suitable to meeting market versatility. The ue feature of this equipment is that it can reduce set up time m hours and days to a matter of a few minutes, allowing the coating nt to quickly and efficiently provide a turnaround of less that two s on new products.

THE FUTURE - 1987 - 1991

visualize the future end result to be a coating plant completely omated. This is an achievable goal - as testament to this there complete yarn dyeing plants in Japan where the process, from inning to end, is completely automated, and only two to three hnicians control the full plant process. Direct labor is thereby uced to only a few mechanics who maintain the equipment.

visualize this same format for the coating industry. Although at coe we have already reached our goals with the System "4" coaters, now turn our attention to the complete coating range. The new ter range will be built on the concept of eliminating total cost of lying compound to fabric, providing the simplist in methods for the sentation of fabric; supply, mixing and application of the pound; drying and curing of the compound; and final simplicity of ding the material to methods suitable for shipment to the customer ll automatically.

would like to introduce the fact that Mascoe has already made major orts in its field. Under a highly sophisticated research program, coe manufactured and installed a complete coating range. The mary objectives of this project were to:

1. improve for excellence - the mechanics, operation and efficiency of the range
2. determine future equipment requirements to full automation
3. reduce overall coating costs by reduction of waste and uniform control
4. experiment with new methods of application
5. experiment with new methods of material handling

coe operated this experimental range for a period of approximately months with fabrics from a random selection of customers. The ration was carefully monitored.

ing the course of this development the following achievements were ained:

1. Reduced Material Handling - in the initial phase five opertors were required to maintain the operation from receipt of fabric in small rolls (100 yards) to final

shipment in 100 yard rolls. In the end result, the process was operated with only two operators at the same speed.

2. Precisely Controlled Application - in the initial phase minimum application rate achievable was 1 ounce per linear yard with a variation of 10% (side, center, side). In the final stages application rates of 1/4 ounce per linear yard were achievable and variation ratio (side, center, side) of 5% were easily obtainable. In the end result the process was operated with only two operators at the same speed.

3. Reduced Waste - in the initial stages 20 to 50 gallons of compound were wasted per process. In the final stages wasted compound was reduced to less than 4 to 5 gallons per process.

It is important to note that in working within the industry, we have observed that the industry accepts 100 to 500 yards product set-up wastage. Most of the new products experimented with first quality products was achieved with less than 10 yards wasted fabric and compound.

We note that Mascoe's patented automatic trough system substantially assisted in the reduction of this waste. Utilizing this system, as many as three different strike patterns were achieved within 10 feet of yardage.

4. Reduced Effluent Discharge (H_2O with compound) - in the initial stages measured cleanup discharge averaged approximately 100 gallons per process. Experimenting with various methods, we achieved a cleanup discharge end result of 5 to 10 gallons per process.

It is important to note the importance of this reduction with regard to the future cost which will be involved with effluent discharge of laytex compounds as EPA rules and regulations prevail, and therefore, the prime consideration should be not to create this problem in the beginning.

5. Reduced Set-up Time - initial phases required almost two hours to set up a process. In final stages it was reduced from 4 hours to approximately 1 hour.

6. Reduced fuel consumption - quantity of fuel consumption was reduced almost 30% through controlled use of startup timing and more efficient nozzle design.

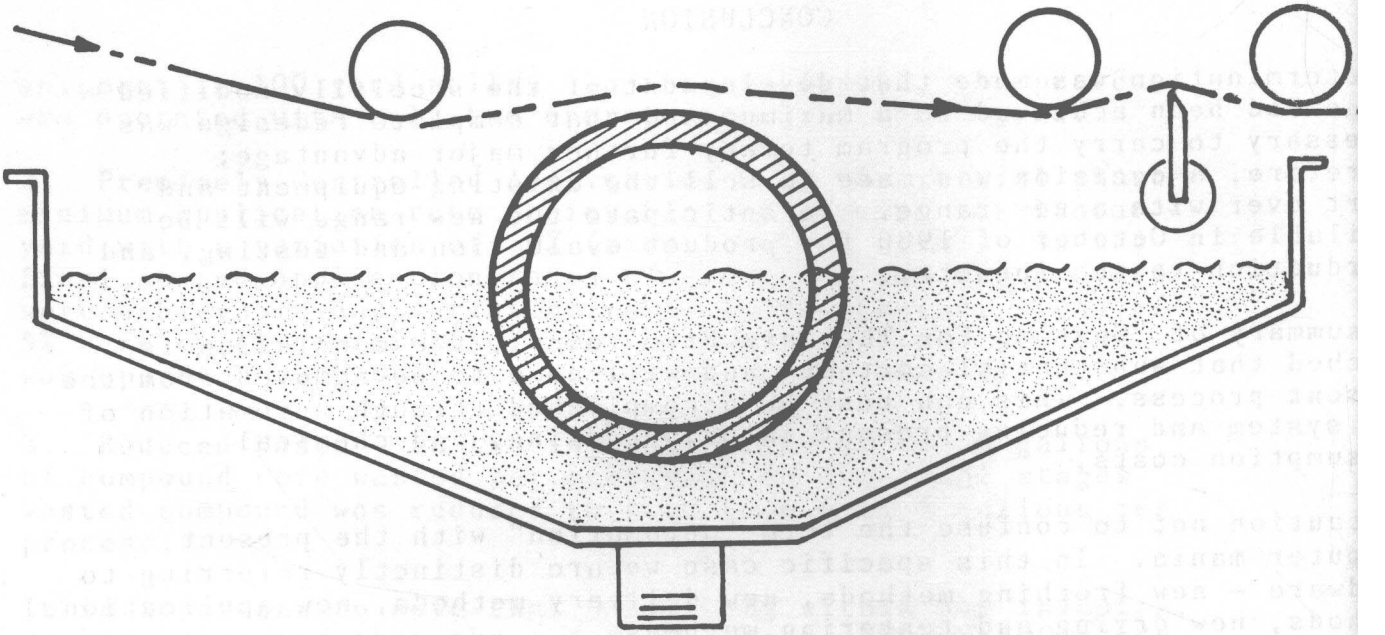
CONCLUSION

letermination was made that development of the specially modified
ıge had been achieved to a maximum and that complete redesign was
cessary to carry the program to any further major advantage;
erefore, a decision was made to sell the existing equipment and
art over with a new range. We anticipate the new range will be
ailable in October of 1986 for product evaluation and testing, and
rduction to the industry.

summary of "Coating For The Next Five Years", the conclusion is
ached that substantial cost can and will need to be removed from the
esent process. This can best be accomplished through automation of
e system and reducing present labor, handling, and chemical
nsumption costs.

caution not to confuse the term "automation" with the present
mputer mania. In this specific case we are distinctly referring to
rdware - new frothing methods, new delivery methods, new application
thods, new drying and tentering methods.

ese, of course, will be coupled with the advantages of programmed
ntrol. The answers are total system analyzation and improvement,
a fix-quick computer added to a 1930 vintage machine.



SUBMERGED ROLL COATERS

The Submered Roll Coater (sometimes referred to as kiss coating) consists of an applicator roll parti submerged in a tank containing the foam solution. The applicator roll picks up solution from the tank deposits it to the fabric surface. A scraper blade, mounted behind the roll, then scrapes excess from the coa surface. Two adjustable positioner rolls are usually mounted directly over the knife. Amount of remair coating is determined by the impingement angel between the knife and roll and adjusted to obtain the des coating.

The amount of coating applied prior to the back scraping blade is determined by the difference (and rotation) between coating roll speed and fabric speed.

The amount of penetration is also determined by this method and by foam viscosity.

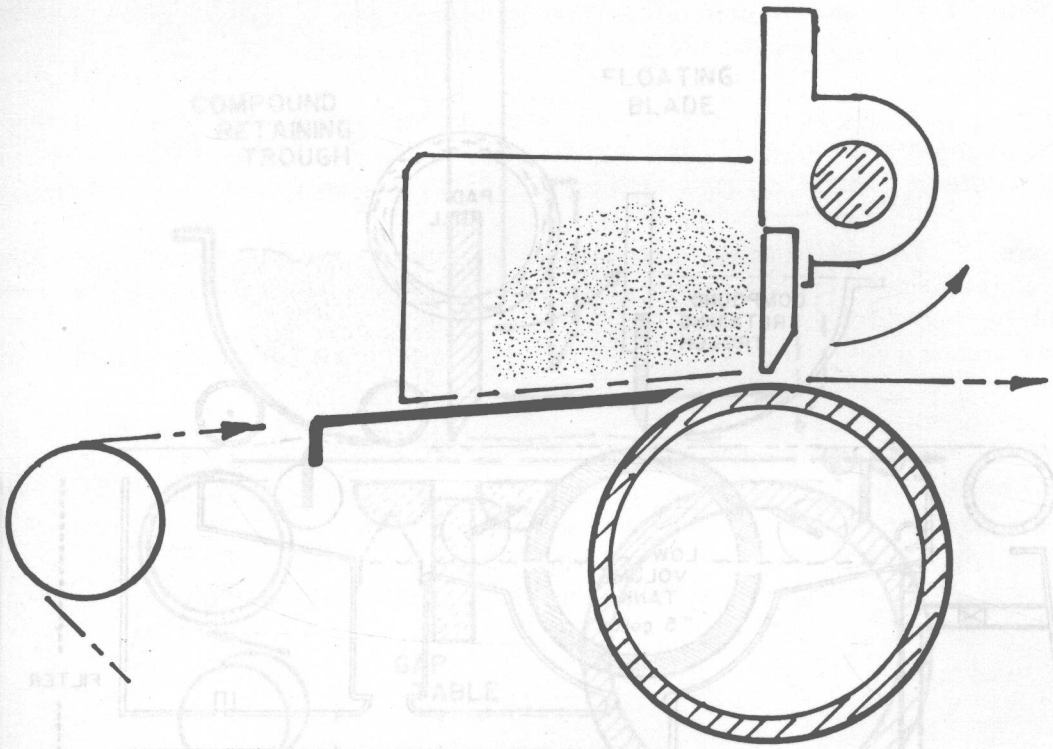
STANDARD SUBMERGED ROLL COATERS

ADVANTAGES:

1. Handles multitude of different width fabrics without blade changes.
2. Usually preferred for application of low viscosity coatings and unfrothed compounds.
3. Excellent control of penetration.

DISADVANTAGES:

1. Linear Fabric Tension - Fabric is usually pulled through the coater without stabilized width control method requires fabrics of stable construction.
2. Since coating is applied prior to tentering, overfeeds cannot be used.
3. Extra foam waste on short runs due to foam tank capacity.
4. Lint particles in foam bath.
5. Difficult to clean.
6. Dryed foam occurring at roll edges.
7. Transfer of coating from fabric selvage to pin or clip if selvage wipers are not used.
8. Gap coatings cannot be produced.



KNIFE OVER ROLL COATERS

e over roll or "gap coating" applies mainly to the drapery industry. This method incorporates a precision positioned directly below a blade assembly.

seam passage the blade is mounted on a swing assembly which rotates to the rear to widen the gap for n passage. With this method a foam bed is applied on top of fabric surface, with a knife removing excess to er a desired coating thickness. The foam is dispensed onto the fabric just before passing through the e assembly. The roll, positioned directly below the blade, provides a support surface for the fabric to pass. blade removes all foam except the desired thickness of coating.

STANDARD KNIFE OVER ROLL COATER

VANTAGES:

- Handles multiple widths of fabrics without blade changes.
- Very uniform coating thickness for gap coating.
- Preferred method for smooth surface coating.

ADVANTAGES: (of standard units available)

- Linear fabric tension - fabric is pulled through coater by tenter, without stabilized width control.
- Limited use with knits or unstable fabrics due to selvage curl or shifting.
- Requires use of selvage wiping system. (automatic dam guides)
- Difficult cleaning.
- Foam build-up on clips or pins with improper dam control.
- Swing blade deposits heavy foam at seam passage.
- Does not allow overfeed capability in tenter process.